Before the

Federal Communications Commission

Washington, DC 20554

In the Matter of	)	
	)	
Amendment of Part 97 of the		)
Commission's Rules Governing	)	RM-11306
the Amateur Radio Service		)
concerning Permitted Emissions	)	
and Control Requirements		)
	)	

COMMENTS OF

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Executive Summary

CQ Communications Inc., a major publisher of amateur radio magazines, books and videos, supports the concept of regulation by bandwidth rather than mode, but has concerns about some of the specifics proposals contained in the ARRL's petition. We are concerned that a proposed exemption on the basis of mode defeats the overall purpose of the petition; that certain modes currently permitted will be prohibited; that the proposal to permit operation of semi-automatic digital stations on all HF amateur frequencies will lead to unintentional interference, and that the League's proposal is "tilted" toward the benefit of a small number of amateurs at the expense of the majority. In addition, we feel that a change to bandwidth-based regulation must necessarily be augmented by strong band-planning, and the FCC must strongly encourage operators to comply with established band plans by putting band plans on the same plane as repeater coordination.

I. Introduction

1. CQ Communications Inc. (CQ) is a leading publisher of magazines, books and videos for the amateur radio and general hobby radio markets. Our amateur radio periodicals include *CQ Amateur Radio* and *CQ VHF* magazines. *CQ Amateur Radio* is the leading independent amateur radio magazine in the United States, in continuous monthly publication since 1945. *CQ VHF* is dedicated to serving the interests of amateurs whose main operating interests lie above 50 MHz. In addition, CQ publishes *Popular Communications*, a general interest magazine for radio hobbyists, plus a full line of amateur radio-related books and videotapes. The company is headquartered in Hicksville, New York.

2. We generally agree with the ARRL's petition. However, we do have some concerns and reservations about specific portions of it. Philosophically, we agree with ARRL that regulation by bandwidth rather than by mode is the best course for the future of amateur radio, in that the line between modes is becoming blurred and greater flexibility is required to encourage future experimentation and innovation. However, we feel that certain aspects of the ARRL's proposal will serve to stifle experimentation and innovation, will prohibit at least one currently-used mode of operation and will favor certain modes over others. In addition, we believe that the League's proposal to carve out a mode-based exception to the proposed regulation-by-bandwidth rule is contradictory to the fundamental basis of the entire proposal.

II. The Need for Bandwidth-Based Regulation

3. The development and growth of digital transmission techniques is blurring the lines between traditionally recognized analog modes. We have reported fairly extensively on digital voice developments and our staff has reviewed digital voice products in the amateur market. One nagging question has been whether a digital voice transmission is, in fact, "phone" or "data." The operator at one end of a contact speaks into a microphone and the operator at the other end hears his/her voice come out of the speaker, but what is sent over the air is actually a datastream. This has resulted in "gray areas," such as the use of digital voice on the 30-meter amateur band, on which only Morse code and data are permitted. Users argue that only data is being transmitted, so they are in compliance with the rules. There would be no ambiguity if signal bandwidths on that band were limited to 200 or 500 Hz. (ARRL proposes a maximum bandwidth of 3.5 kHz for a portion of 30 meters. We disagree with that and will discuss it later.)

4. As the use of digital technologies, including digital voice, grows and the technology for its use - particularly on HF - matures, the need will increase for still greater flexibility among amateurs in developing and/or adapting these technologies for amateur use. Throughout the 20th century, amateur radio experimenters were responsible for many advances in techniques and equipment for analog radio communication. They worked mostly in the analog world of hardware, finding new ways to arrange and combine physical components to achieve their goals. In the 21st century, experimenters tend to work primarily in the digital world of software, finding new ways to program computers and microprocessors to achieve their goals. Rather than designing a tuned circuit to produce a single sideband voice transmission, for example, they design software to get a computer to produce the equivalent, but perhaps with the audio quality of AM or FM. The wide variety of digital modulation techniques already developed and certain to be developed in the future require greater flexibility in terms of what may be transmitted over the air and how. If 21st century amateurs are to continue to fulfill the Basis and Purpose of the service as stated in Part 97.1(b) of the FCC rules -- "Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art" -- then they must not be constrained by regulations designed for the analog world of the 20th century. On the other hand, these technical pioneers have always been in the minority of amateurs overall, with the majority being much slower to adapt to change. Therefore, any change in the basis of our regulations must recognize this and accommodate those who will continue to use analog techniques for many years to come.

5. One thing that quickly becomes obvious to anyone using digital transmissions on the amateur bands, particularly on the HF bands, is that digital signals and analog signals are not compatible with each other.

Shifting from mode-based to bandwidth-based regulation will not succeed without being accompanied by strong band-planning to minimize interference among mutually-incompatible transmissions. As we will discuss later, we believe that while bandplans should continue to be voluntary, the Commission needs to add some "teeth" to bandplan adherence as part of any shift to bandwidth-based regulation.

III. Concern: Mode-Based Exemptions and Currently Authorized Modes

6. We reiterate that we concur with the ARRL proposal philosophically and on most specific points. One in particular on which we agree is the League's proposal to define bandwidth in terms of *necessary bandwidth* rather than *occupied bandwidth*, so as not to require individual amateurs to concern themselves with measurement of their actual signal bandwidth on the air.[1] However, there are some specifics with which we disagree or are concerned about unintended consequences.

7. In the opening paragraph of its *Petition*, the ARRL states that it seeks new flexibility for new transmission techniques, "while permitting present operating modes to continue to be used for as long as there are radio amateurs who wish to use them." It then proposes[2] a *mode-based* exemption for double-sideband AM, which we believe defeats the entire purpose of converting to bandwidth-based regulation. If accommodations are to be made for AM (which we believe should be done), they should be on the basis of bandwidth, not of mode.

8. The ARRL further discusses Independent Sideband (ISB)[3], which it notes is currently specifically permitted by FCC rules [Section 97.207(f)(2)] although it has not been used in the Amateur Service for at least the past ten years. "ISB operation would, however, be permitted," the League says, "in the segments in which a 6 kHz or greater bandwidth is permitted," However, the League's proposal does not include any segments below 29 MHz in which a 6 kHz or greater bandwidth would be permitted. This would effectively prohibit the use on HF of a mode which is currently permitted anywhere that an AM phone signal is permitted. In addition, a growing number of amateurs are using a mode known as Enhanced or Extended Single Sideband (ESSB). This mode tries to offer the audio quality of an AM signal in a smaller SSB bandwidth. However, an ESSB bandwidth is generally about 4.5 kHz, half that of a DSB AM signal, but still larger than a typical 3.5 kHz SSB signal. While not specifically covered in the current rules, this mode is currently

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[1] ARRL *Petition* in the above-referenced matter, paragraph 13
[2] *Petition*, paragraph 14
[3] ibid

perfectly legal on the amateur HF Phone segments. The ARRL's proposal to limit maximum bandwidth on all frequencies below 29 MHz -- except for the mode-based exemption of DSB AM -- to 3.5 kHz, would effectively prohibit this currently-permitted mode as well. While there are disagreements among amateurs as to whether ESSB is an efficient use of spectrum, the fact remains that it is a currently permitted mode which would be prohibited under the ARRL proposal while DSB AM signals occupying twice the bandwidth would continue to be permitted. The ARRL is being disingenuous in its contention that adoption of its proposal would permit all modes currently in use to continue to be used, as such modes as ISB and ESSB would be restricted to frequencies above 29 MHz despite the fact that they are currently permitted on all HF "phone" subbands.

9. In addition, while the ARRL's laudable goal in this proceeding is to encourage greater flexibility to experiment with new and more efficient transmission modes, the specifics of its proposal favor certain modes and may actually inhibit some types of experimentation. While it proposes offering bandwidths up to 3.5 kHz in portions of some band segments that currently are reserved for CW and data transmissions, in hopes of encouraging higher-speed digital modes with up to 3.5 kHz bandwidth, the cap of 3.5 kHz on all frequencies below 29 MHz closes the door on the possibility of developing future modes that may be very efficient yet have broader bandwidths. Examples of such modes in current technology are spread-spectrum and ultra-wideband. While these modes in their current forms are inappropriate for use on the HF amateur bands, perhaps some variation on the concepts behind them will be developed that would be suitable. We should not discourage experimentation with future modes that may occupy more than 3.5 kHz of bandwidth.

10. It is noteworthy that the ARRL's *Petition* includes a definition for a bandwidth of 9 kHz as the recommended maximum for a DSB AM emission, and states that the 9 kHz bandwidth appears in its proposed Appendix[4], in fact, its only mention in the Appendix is in a footnote to the proposed frequency table.[5]

11. A simple solution to all of these problems (mode-based exemptions, currently authorized modes that would be prohibited and future modes that may be broader than 3.5 kHz) is to either create additional segments where broader signals are permitted or to authorize a larger maximum bandwidth in the current phone subbands. The 9 kHz bandwidth of a DSB AM signal seems to cover most everything, and we would propose either establishing segments in which the maximum permitted bandwidth is 9 kHz or

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[4] ARRL *Petition*, paragraph 18

[5] ARRL *Petition*, Appendix, proposed §97.307(f)(1)

substituting a maximum bandwidth of 9 kHz for all segments proposed by ARRL for 3.5 kHz maxima. Our preference would be to subdivide the proposed 3.5 kHz segments to include segments on which bandwidths of up to 9 kHz would be permitted, regardless of whether the mode is DSB AM, ISB, ESSB or some other mode that is yet to be developed. (See Appendix)

12. The only other issue we have with ARRL in regard to its proposals for bandwidth maxima is the inclusion of a 3.5 kHz segment on the 30-meter band (10.135-10.150 MHz). The entire band is only 50 kHz wide. When it was introduced after WARC-79, the Commission limited permitted modes on the band to CW and data, reasoning (correctly, we believe) that it was too narrow an allocation to support signals as wide as a single sideband voice signal. We believe this continues to be the case. There is no difference between a 3.5-kHz wide voice signal and a 3.5-kHz wide data signal. The maximum permitted bandwidth on 30 meters should be 500 Hz, due to the overall narrowness of the band itself.

IV. Concern: Semi-Automatic Digital Stations

13. The ARRL's proposal to permit semi-automatic digital stations throughout the HF amateur bands[6] is particularly troubling to us because it ignores the realities of radio wave propagation on the HF bands, and the ARRL should know better. A considerate amateur in New York, exercising "respectful operating practices," as the League's *Petition* puts it, could listen and hear a clear frequency before activating a semi-automatic station in Missouri. At the same time, however, there could be a contact in progress on the same frequency between stations in California and Idaho, neither of whom can be heard by the station in New York. Both of the western stations, however, might be able to hear the semi-automatic station in Missouri, and its transmissions would cause them harmful interference, totally unbeknownst to the considerate and respectful operator in the east. Furthermore, it would be impossible to ask the semi-automatic station to change frequency.

14. One of the cornerstones of the Amateur service is that all amateur frequencies are shared and that no station has any greater claim than any other station to operate on a given frequency. On frequencies above 29 MHz, this concept has been modified somewhat by the reality that repeater stations are "locked" into a specific set of frequencies, and an extensive system of voluntary coordination has been established to promote harmonious operation and minimize interference among repeater stations. This concept has never been generally applied to the much smaller and more crowded HF bands, where all frequencies are shared by all users. A limited number of automatically-controlled HF digital stations (also on a set frequency) has

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[6] ARRL *Petition*, paragraph 16

been accommodated, but in very small segments of each band as authorized by §97.221(b). Permitting the operation of "frequency-locked" stations throughout the HF amateur bands will mark a fundamental change in this important aspect of our service and should not be undertaken lightly.

15. Proponents of this change argue that interference will be minimal because there currently are relatively few stations that would be making use of these semi-automatic stations - specifically those operating a radio e-mail program called Winlink 2000 via the Pactor-III protocol. If, indeed, there are so few stations using Winlink 2000, then why is it necessary to change the rules to permit the operation of semi-automatic Winlink 2000 stations throughout the HF amateur bands? And if the goal is to greatly increase the number of stations using Winlink 2000 (which the ARRL promotes and has adopted as its "official" HF digital mode for emergency communications), then the potential for unintentional yet still harmful interference will be greatly increased as well.

16. We do not feel the proposed change is justified. Should the Commission agree to the requested change, however, it must do so only in conjunction with a requirement that all semi-automatic stations must incorporate "listen-before-transmit" protocols to prevent unintentional interference with stations that cannot be heard by the controlling station. While we realize that such technology is not yet fully mature, such a requirement will doubtless spur progress and most importantly, will protect other users of our shared frequencies.

V. The Need for Strong Band Planning

17. The key to success of any change from mode-based to bandwidth-based subband regulation lies in its being accompanied by strong band planning to minimize interference between incompatible modes (such as analog and digital voice). Band planning should continue to be voluntary and flexible, but it must be made clear to the amateur community that the FCC expects its licensees to comply with the band plans in most situations. We see this as analogous to the situation with repeater coordination - it remains voluntary, but the Commission has made it clear that in cases of interference between a coordinated and a non-coordinated repeater, the licensee of the non-coordinated repeater has the primary responsibility to resolve the interference, even if it means going off the air. We believe the same policy should apply in the case of band plans. In cases of interference between two stations, one of which is in compliance with the generally accepted band plan for the frequency in question and one of which is not, it should be the primary responsibility of the non-compliant station to resolve the problem, even if it means changing frequency or going off the air.

18. In furtherance of this goal, we will propose adding a new paragraph (e) to §97.101, General Standards (see Appendix). This should be

considered even if the overall bandwidth regulation proposal is denied. At minimum, a sentence should be added to §97.101(a), stating: "Adherence to generally accepted voluntary band plans is considered good amateur practice."

VI. Miscellaneous

19. There is one other element of the ARRL's proposal which we feel could be clearer, specifically that regarding permission to use any "published digital codes."[7] We believe the rules must be more specific regarding FCC access to any such codes, which may be published in an obscure foreign-language source, and that greater flexibility needs to be given to the Enforcement Bureau in assuring compliance with FCC rules regarding digital codes. In our Appendix, we will propose adding language requiring that the FCC be provided upon request with a copy of any digital code in use, along with the software necessary to read and/or generate such code; and to permit the Enforcement Bureau the option of using any or all of the three remedies listed in paragraph (b) rather than requiring that all three be used at once.

20. Finally, we are in full agreement with ARRL that it would be inappropriate to remove all subband regulations and allow all amateurs to use whatever mode or bandwidth they like at any point within a designated amateur band. Canada's success in doing so has been cited as justification for doing so here in the U.S. But Canada has far fewer amateurs than does the U.S., and one reason for their band structure is to provide Canadian amateurs with places where they can operate voice without having to compete with their neighbors to the south. If we were to do the same, it would remove all protections not only from our Canadian neighbors but from U.S. amateurs using less popular operating modes. There must continue to be some regulatory protection for smaller bandwidth "weak signal" modes.

VII. CQ's Counterproposals

21. In light of all of the above, we propose certain modifications to the specifics of the ARRL's proposal. We will detail them in the Appendix and summarize them here.
1) Establish band segments on which a maximum bandwidth of 9 kHz will be permitted, in order to best accommodate all currently authorized modes and permit experimentation with modes that may achieve efficiency through means other than narrower bandwidths.
2) Establish a maximum bandwidth of 500 Hz on the 30-meter (10 MHz) band.

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[7] ARRL *Petition*, Appendix, proposed §97.309

3) Eliminate mode-based exceptions to bandwidth regulation.
4) Retain current limitations on automatic/semi-automatic digital stations or require that semi-automatic stations incorporate listen-before-transmit protocols.
5) Add language to the rules making compliance with generally accepted band plans equivalent to compliance with repeater coordination, and placing the primary responsibility for resolving any interference problems on a station that is not complying with the band plans; and
6) Require amateurs using non-standard digital codes to provide the FCC, upon request, with a copy of the code and the software necessary to read it.

VIII. Conclusion

21. In conclusion, CQ generally supports the ARRL's petition but we have problems with some of the specifics and offer alternatives in the following Appendix. We join the ARRL in seeking an early Notice of Proposed Rule Making on this matter of importance to the future of the Amateur Service and its ability to remain in the forefront of technical innovation.

Respectfully submitted,

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By
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Appendix

We propose the following changes to the revisions proposed by the ARRL in its *Petition*. We include only those sections with which we do not agree with ARRL. Our proposed changes are in *italics.*

Proposed Rule Changes

Part 97 of Chapter I of Title 47 of the Code of Federal Regulations is proposed to be amended as follows:

Section 97.101 is amended by adding a new subsection (e) as follows:

§97.101 General Standards

* * * *

(e) Where the transmissions of a station cause harmful interference to another station, the two station licensees are equally and fully responsible for resolving the interference unless one station is operating in compliance with the generally accepted band plan for the frequency in question and the other station is not in compliance with said band plan. In that case, the licensee of the non-compliant station has the primary responsibility to resolve the interference.

Section 97.221 is amended to read as follows:

Keep §97.221(c) as it is.

-or-

§97.221 Automatically controlled stations transmitting RTTY or data emissions.

* * * *

(c) A station transmitting a RTTY or data emission may be automatically controlled on any other frequency authorized for *signals of such bandwidth* provided that the station is responding to interrogation by a station under local or remote control *and provided that the station incorporates a listen-before-transmit protocol to minimize the possibility of unintentional interference.*

Section 97.305 is amended to read as follows:

§97.305 Authorized emission types

* * * *

(e) Except as otherwise provided in this Section, a station may transmit any emission on any frequency authorized to the control operator, *consistent with generally accepted band plans and* subject to the following bandwidth limitations:

Note: The following table contains only those bands and band segments for which we are recommending a change from the ARRL proposal. No 9 kHz subbands are proposed for 17 or 12 meters, as AM has never been a traditional mode on these bands; in addition, we propose maintaining a maximum 500 Hz bandwidth on the entire upper end of the 30-meter band.

Wavelength Band	Frequencies Authorized	Maximum bandwidth	Standards See §97.307(f) paragraph
			Note: Only change proposed for standards is the elimination of ARRL's note (1), the exception for DSB AM
160 m	Entire band	*9 kHz*	
75 m	*3.620-3.950 MHz*	*3.5 kHz*	
-do-	*3.950-4.000 MHz*	*9 kHz*	
40 m	*7.100-7.250 MHz*	*3.5 kHz*	
-do-	*7.250-7.300 MHz*	*9 kHz*	
30 m	*10.120-10.150 MHz*	*500 Hz*	
20 m	*14.100-14.300 MHz*	*3.5 kHz*	
-do-	*14.300-14.350 MHz*	*9 kHz*	
15 m	*21.150-21.400 MHz*	*3.5 kHz*	
-do-	*21.400-21.450 MHz*	*9 kHz*	
10 m	*28.120-28.500 MHz*	*3.5 kHz*	
-do-	*28.500-29.000 MHz*	*9 kHz*	

Section 97.307(f) is amended to read as follows:

§97.307 Emission standards

* * * *

(f) The following standards and limitations apply to transmissions on the frequencies specified in §97.305(e) of this Part.

(1) **Deleted - Note: this refers to ARRL's proposed (1), not the current §97.307(f)(1). Making the changes proposed above will make the exception for double sideband amplitude modulated phone A3E emissions unnecessary. ARRL's notes (2) and (3) would be renumbered (1) and (2), and would replace current (1) through (13).**

Section 97.309 is amended to read as follows:

§97.309 RTTY and data emission modes

(a) Where authorized by §97.305(e) and §97.307(f) of this Part, an amateur station may transmit a RTTY or data emission using published digital codes for the purpose of facilitating communications. *A copy of any such code and/or software to generate/read such code must be provided to the FCC upon request.*

(b) When deemed necessary by the FCC's Enforcement Bureau to assure compliance with the FCC Rules, a station must:
(1) Cease the transmission using the *digital code in question*;
(2) Restrict transmissions of any digital code to the extent instructed; *and/or*
(3) Maintain a record, convertible to the original information, of all digital communications transmitted.

Note: In all other respects, we concur with the ARRL's proposed changes.